User's Guide to the Groundfish Catch Statistics Data System of the Fisheries Research Branch, Pacific Region

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September 1985

Canadian Technical Report of Fisheries and Aquatic Sciences No. 1395

86-0412/

Canadian Technical Report of Fisheries and Aquatic Sciences

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Cat. No. Fs97-6/1395E ISSN 0706-6457

Correct citation for this publication:

Leaman, J. E. and J. M. Hamer. 1985. User's guide to the groundfish catch statistics data system of the Fisheries Research Branch, Pacific Region. Can. Tech. Rep. Fish. Aquat. Sci. 1395: 31 p.

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ABSTRACT

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The Fisheries Research Branch maintains the B.C. groundfish catch statistics. Data on species catch, effort, fishing area, depth, and gear information by vessel landing are processed through interactive data entry and stored on-line. A general use data retrieval program (GFSEL) is implemented by user specified dialogue to access the data files. More specific data analyses are performed on the groundfish catch statistics by interfacing user programs with the data base subroutine GFREAD.

Key words: groundfish catch statistics, data base, user's guide

RÉSUMÉ

Leaman, J. E. and J. M. Hamer. 1985. User's guide to the groundfish catch statistics data system of the Fisheries Research Branch, Pacific Region. Can. Tech. Rep. Fish. Aquat. Sci. 1395: 31 p.

La Direction de la recherche sur les pêches est responsable des statistiques sur les prises de poissons de fond réalisées en C.-B. Les données sur les prises selon l'espèce, l'effort, la zone de pêche, la profondeur et les engins relatives à chaque débarquement sont traitées à l'aide d'un terminal de dialogue pour l'entrée des données et al mémorisation en direct. Un programme d'extraction de données pour utilisation générale (GFSEL) est mis en application à l'aide d'un dialogue écrit par l'utilisateur lui donnant l'accès aux fichiers de données. Les statistiques sur les prises de poissons de fond sont analysées en profondeur à l'aide de liaisons entre les programmes destinés à l'utilisateur et le sous-programme GFREAD du fichier central.

Mots-clés: statistiques sur les prises de poissons de fond, fichier central, guide de l'utilisateur

INTRODUCTION

The Fisheries Research Branch of the Department of Fisheries and Oceans, Nanaimo, B.C. has maintained detailed statistics of groundfish landings by trawl gear since 1954 and by longline and trap gear since 1979. This data base has been resident on a succession of computers (IBM 1130, Xerox 530, DATA GENERAL NOVA 2/10, DEC VAX 11/780) however it was not until the acquisition of the VAX computer that on-line access to the data base was possible. The IBM and Xerox computers did not support time-shared environments and interrogation of the data was both cumbersome and inefficient. An interim measure of interactive access was implemented in 1978 with creation of an input/retrieval system on the NOVA 2/10 for current-year data. That system allowed interrogation of the data as well as fixed-format reporting for management of catch quotas. The system was implemented by L. A. Lapi after a conceptual design by L. A. Lapi and B. M. Leaman.

The system described in this report was the final step in the creation of an on-line database system for both real-time quota management needs and analytical research. It is resident on the VAX 11/780 at the Pacific Biological Station and is made available to groundfish users. Because the majority of these data are obtained from vessel masters on a confidential basis, its management is performed solely by the Groundfish Statistics and Sampling Unit for security reasons. Conceptual design of the system was by J. M. Hamer and L. A. Lapi with user input from J. E. Leaman and B. M. Leaman. System architecture[1] and implementation was by J. M. Hamer. This system is designed to provide interactive data entry, fixed-format reporting as well as an interrogation system which allows researchers to examine both aggregated and individual data, to the resolution of the smallest data element if the user has the appropriate priority access. The system has been operational since 1982.

The intent of this report is to provide users with a guide for access to the historical groundfish data base. The processes involved in collecting, entering, and editing these data are also reported to enable users to understand the physical and logical structure of the system.

Section I describes the methods of collection and types of data collected from the groundfish fishery. The design of the data base is given in Section II with an explanation of the software system for entering the data. A description of the data interrogation and retrieval system is provided in Section III. This access program, called GFSEL, is available to Groundfish Division staff at the research station.

Appendix I shows examples of data acquisition forms. A definition of the codes used for data input is presented in Appendix II. A sample run and results of the data retrieval program are given in Appendix III.

---

[1]All programs are written in VAX-11 FORTRAN (based on ANSI FORTRAN-77)

I. Data Collection

There are two sources for groundfish catch data; trip reports and sales slips. The trip reports are obtained from vessel captains interviewed by the PBS liaison officers as each groundfish vessel lands at the processing plant. The skipper supplies confidential logbook information on location, and depth of fishing ground, amount of effort expended, and estimates of weight by species or species group. The liaison officers also observe the unloading of the vessel to obtain more detail on species composition and collect biological samples of the landed fish to verify and augment the fishing log. When skippers or processing plants only provide catches by species groups (e.g. rockfish, sole), the species composition observation by port samplers is applied to these groups to obtain the most accurate catch number for individual species. At this point the data are not verified by weight tallies and are called 'hails' or 'soft' data.

Sales slips (weight tallies) are submitted to the Economics and Statistical Branch of the Department of Fisheries and Oceans by the fish processing plants and fishermen. These sales slips record the actual catch weight by species ('hard' data) and the price paid, but do not contain information on fishing effort, depths fished, fishing ground locations or the species composition of grouped product names (e.g. 'rockfish', 'ocean perch', 'sole'). The latter arise because processors pay a single price for several different species although data on individual species is required for stock assessment.

Combination of these two methods results in the assignment of correct species and area breakdown where none existed on the sales slips. Also, vessel landings which were not covered by trip report interviews are supplied as sales slips data to the PBS Statistics and Sampling Unit.

The actual weights from the sales slips are substituted onto the trip reports when available and prorated to replace the estimates supplied by the fishermen. This updating to the actual net weights is done at the end of each month, thereby changing the 'soft' data to 'hard' data. In a given year then, the data used for quota management consists of 1.5-2.0 months of 'soft' data and the remainder as 'hard' data. Data are identified externally as to character (hard/soft) within a given year.

II. Data Entry Sub-system

The groundfish statistical unit is solely responsible for data input and maintenance. This section is presented only as background information for the user; entry into this sub-system is restricted. This sub-system began with 1982 data. Files for the years 1954-81 can be maintained by the GFEDIT program outlined in Appendix IV.

A. System Design

The information collected on trip reports and sales slips is entered

via the program "CATCH" which uses the VAX-11 forms management system (FMS) to facilitate data entry. CATCH creates files for the storage and maintenance of the catch data. Data is entered and verified before the program "BUILD" is run to create direct access data and key files (DAF) for use by the data retrieval program. Figure 1 is a flow chart of the processes involved with the managment of the CATCH-BUILD system. The programs and files involved in this system are outlined below:

1. VESSEL

VESSEL is a program which maintains the master file (GFVESSELS.MST) on boat name (vessel code), gross tonnage (class code), and horsepower for each year. The functions of the program are to add, modify, inquire, and list (creates a file DEMERSALV.LIS). There is also a HELP facility which describes any of the above program requests. To run this program type VESSEL.

2. CATCH

The maintenance of the year-to-date catch file and yearly key file is performed by the program CATCH. It invokes the Forms Management System to format and drive the terminal screen (Fig. 2). To run, type CATCH.

3. NEWYEAR

In order to start entering a new year of catch data the program NEWYEAR must first be invoked to open the new files (19nn.YTD and 19nn.KEY). To run type RUN DRA1:[QHAMER.DEMERSAL]NEWYEAR.

4. 19nn.YTD

The year-to-date file, which stores the current trip report and sales slip data entered via the program CATCH, is named 19nn.YTD (where nn represents the year of data).

5. 19nn.KEY

19nn.KEY is a key file which indicates to the CATCH program where in the 19nn.YTD file to find the last record with the serial number requested.

6. BACKUPnn

A command file (BACKUPnn) copies (backs up) the year-to-date file and its key file from the disk onto a tape.

7. BUILD

The program BUILD reads the year-to-date file, sorts it by source, minor area, month, day and serial number, and writes it in a direct access

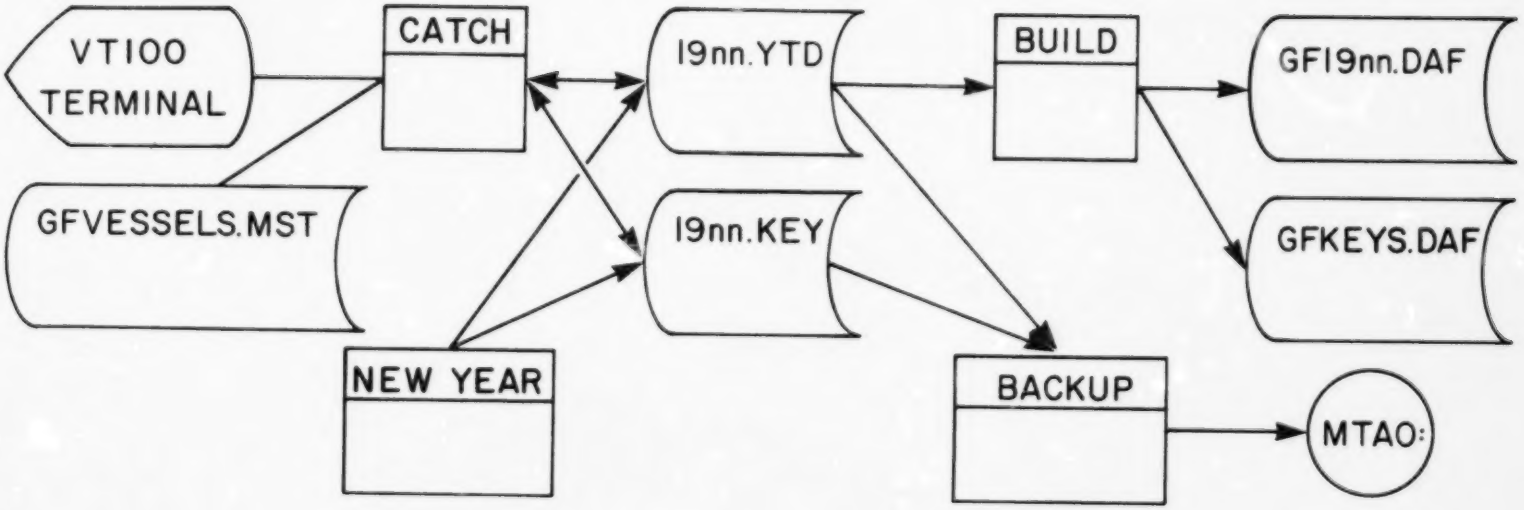

Fig. 1. Flow chart of programs and files involved with the management of the CATCH-BUILD system.

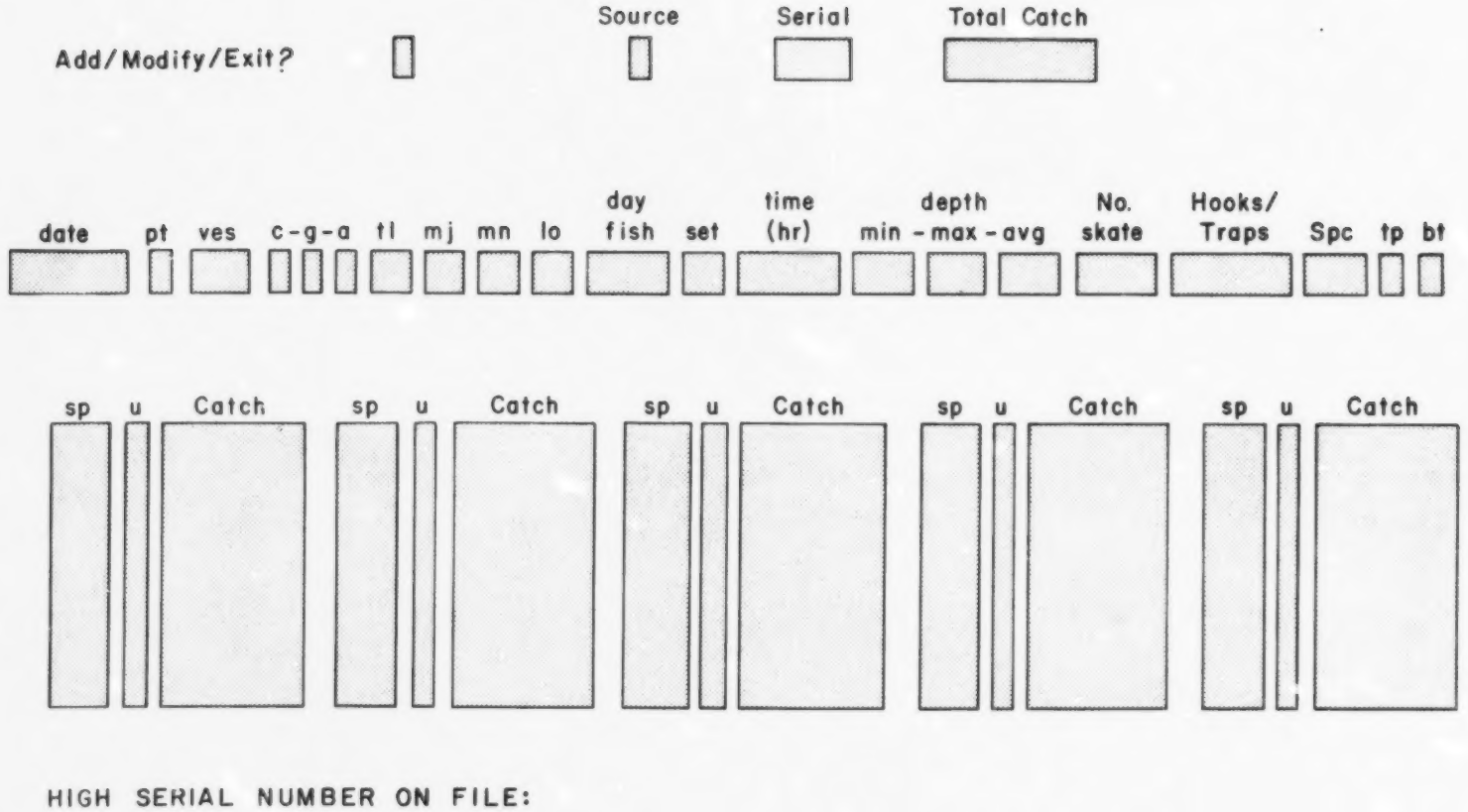

Fig. 2. The Forms Management System (FMS) format invoked on the terminal screen by the program CATCH for groundfish catch data entry.

file (GF19nn.DAF) for data retrieval. At the same time it builds a new key file (GFKEYS.DAF) for use with the user's access programs.

8. GF19nn.DAF

The sorted catch data are stored in binary, free-format 100-byte records in the direct access file GF19nn.DAF. Each year is a separate file.

9. GFKEYS.DAF

GFKEYS.DAF is a master key file with one record for each year. This record contains the addresses for each source and minor area in the direct access file (GF19nn.DAF).

B. Error Controls in Catch Software

Within the data entry sub-system there are subroutines which check for errors as the data are keyed onto the screen. An error message and a bell will notify the user when an incorrect entry has been made. A list of the fields (Appendix II) that are verified and their qualifications is noted below:

1. source - must be 1 to 6.
2. serial - must be numeric.
3. date - day must be 1 to 31, month must be 1 to 12, and year must equal the year to date file specified at the beginning of the CATCH program.
4. port - must be numeric or blank.
5. vessel - checks the vessel master file (GFVESSELS.MST) that the vessel number entered is a valid code for the year of data.
6. class - mandatory only for trawl, must be numeric.
   - must equal the class code stored on the master vessel file.
7. gear - only used for trawl gear.
   - must be numeric or blank.
8. aids - only used for trawl gear.
   - must be 0 to 7 or blank.
9. trip length - trawl gear maximum is 30 days.
   - other gear maximum is 99 days.
10. major - must be 1 to 10.
11. minor - must be 1 to 35 and within the major area outlined in Appendix II.
12. locality - the maximum number is set for each minor area (see locality code sheet maintained by Statistical Unit).
13. days fished - must be less than the trip length.

14. sets or drags - only used when data are from a trip report.
    - must be numeric or blank.
15. time (hours) - only used when data are from a trip report.
    - must be numeric or blank.
    - mandatory for trawl trip report.
16. depth - only used when data are from a trip report.
    - maximum depth for trawl is 500 fathoms but has an option to override.
    - the maximum depth must be greater than the average depth which must be greater than the minimum depth.
    - must be numeric or blank.
17. skate - only used when data are from a longline or trap trip report.
    - must be numeric or blank.
18. hooks or traps - only used when data are from a longline or trap trip report, for which entry is mandatory.
    - must be numeric or blank.
19. spacing - only used when data are from a longline or trap trip report.
    - must be numeric or blank.
20. trap - only used when data are from a trap trip report.
    - must be 0 to 3 or blank.
21. bait - only used when data are from a longline or trap trip report.
    - must be 1 to 8 or blank.
22. species - must be valid species code as defined by species table built at beginning of program (Hart codes).
    - checks for duplication of species and utilization entries.
23. utilization - mandatory with species code entry.
    - must be 1 to 7.
24. catch - must be numeric.

C. Operation of Data Input System

The operation of the catch data input system is invoked by the statistics unit personnel typing "CATCH". The program opens appropriate data key and vessel files and displays the entry form on the screen. Data can be entered or edited by dialogue with the program. Appendix II lists the fields shown on the screen and the codes for these fields. When a field is full the cursor will automatically move to the next field. Pressing the carriage return will also move the cursor to the next field. The followny is a description of the options implemented when CATCH is run.

1. ADD

An A (add) response to the dialogue query is used to enter new trip report or sales slip records to the file. The screen is cleared and the data entry form is displayed with another query "new header (Y/N)". A new header

is required when entering a new serial number (new landing) for the first time, with data entry beginning in the source field. Codes are keyed into their appropriate columns on the screen. To repeat the same serial number (trip) but with a different fishing locality, the last header record is duplicated in fields 1 through 9. With these fields full, the cursor can then be moved to the major area to begin entering the next area's data. When data entry for a record is complete, type enough slashes (///) to fill one of the fields for species code, or utilization, or catch. This will update the total catch in the master record and on the screen which can then be verified with the raw data. If changes are to be made to this record before it is written in the master file an E (EDIT) should be entered. When the corrections are in the header portion, enter H, to set the cursor on the date field. Enter C, when data in the species catch section of the record is to be changed. The cursor will be positioned at the first species code field. Enter the corrections and exit from the record (enter /// as above). To write this record onto the master file and update the yearly key file, respond with an S (SAVE). A D (DELETE) response means the record will be deleted from the master file.

2. MODIFY

Enter M (MODIFY) to view a record that has been saved in the file, in order to check or edit the data. The cursor is set at the serial number field and waits for an entry. The program reads the key file (19nn.KEY) to find the address of the last record written with the entered serial number. It locates the address, retreives the record and displays it on the screen. If this displayed record needs correcting, a Y (YES) response is required and the system moves into the edit mode (same as above). An N (NO) answer means this record is not the one you are seeking. It finds and displays the next record with the same serial number and then continues with the last record of the next highest serial number until it reaches the end of the file.

3. EXIT

The E (EXIT) option signifies a departure from the CATCH program. A Y (YES) response to the "UPDATE GFSEL?" query will submit the program BUILD to run. This will update the current year's direct access file and the key file and return to the VAX VMS operating system. If you wish to leave this program without invoking the BUILD program a N (NO) answer is needed. The direct access file (GF19nn.DAF) and the key file (GFKEYS.DAF) will not be updated (i.e. these files will not be the same as the year-to-date files if changes were made while running the CATCH program).

D. Incorporation of New Data

After data modifications or additions are performed the user access files must be rebuilt for the most recent catch information to be accessible. BUILD is invoked by choosing the option to update GFSEL in the data entry system. BUILD reads the year-to-date file and creates a new file (GF19nn.DAF)

sorted by source, minor area, month, day, and serial number. It notes at what record number (address) the key fields (source and minor area) change. This information is stored in one record for each year in the main key file (GFKEYS.DAF). Each record contains an array (6,35) of starting addresses for each source and minor area. Each time a year's data is rebuilt a new file for that year is created and new starting addresses are placed in the key file. This procedure should be performed whenever data entry or modifications have been verified to ensure that the most accurate information is available.

III. Data Retrieval

A. GFSEL Program

A general use data retrieval program called groundfish selection (GFSEL) was developed to gain access to the data files. A series of criteria for the desired data are specified by the user through dialogue with the program (to run, type: GFSEL). It then proceeds to the search phase, selects the records which fit the specifications and summarizes the catch and effort data on the screen. These results are also saved in a file (GFSEL.AUD) in the users directory for later viewing or printing (sample run and results are provided in Appendix III). GFSEL contains a HELP function which lists all of the field name options and a HELP function within each option. The following describes the field names available as selection criteria and the code restrictions.

1. Overview

GFSEL asks you for a series of selection criteria and then proceeds to the selection phase. Generally, the more explicit your criteria are, the faster the program will run. In particular, restricting it to specific years, areas, and sources will aid the search (they control the file reads). Usually the first two characters suffice as a reply to a question, e.g. SO for SOURCE. A carriage return (<CR>) is usually interpreted as a NO reply. When you have entered all your selection requirements type <CR> to proceed to the search phase. If you are running in BATCH and wish to suppress printer output, put the following statement at the beginning of your command file: $ASS NL SYS$OUTPUT.

2. Filename

By default, an echo of your selection criteria and a run summary will be written into a file named GFSEL.AUD in your directory. An alternate filename may be specified with this option.

3. Save

This option allows you to save selected landings in a file in your directory. For each landing the program will write a header record followed by one record for each species-utilization entry. The format is:

01-01 Source, 02-05 Serial, 06-11 DDMMYY
12-12 Port, 13-15 Vessel, 16-18 Class-gear-aid
19-20 Trip len, 21-26 Major-minor-locn
27-30 Days fished (F4.1), 31-32 No. sets
33-37 Time (min), 38-46 Depth (min-max-avg)
47-50 No. skates, 51-56 No. hooks, 57-59 Hook space
60-60 Trap type, 61-61 Bait, 62-63 No. species entries
64-70 Total catch
Species records:
1-3 species code, 4-4 utilization, 5-11 catch

4. YEAR

Enter the year as two digits, eg. 67 for 1967. There is no data available prior to 1954.

5. SOURCE

There are six source codes.

6. MAJOR

Note that the entry of a major area number implies a search by all minor areas within the major. There are ten major area codes, 1 through 10. Only numeric codes are accepted.

7. MINOR

There are thirty-five minor area codes, 1 through 35. No alphabetic characteristics are accepted. If you are qualifying minor area with location codes you may only select one minor area code at a time. Note that minor area codes are unique. There are twenty valid location codes (0 through 19). Not all 20 are valid for all minor areas. This program does not check the validity of a locality code.

8. SPECIES

Species codes must be 0 through 999. The species number may be found by using the HART option.

(i) Qualification - must be an integer within the range 0 to 100. Entering a qualification level specifies the minimum species catch/total catch percentage for a record to be selected. When qualification is linked with particular utility codes, the program will select as follows: (total catch for species/total catch all species)*100, where totals are computed using only the specified utilization codes.
(ii) Utilization - valid codes are 1 through 7.

9. HART

GFSEL requests and reports species information by number. HART will look up a species number and give you its name, or look up a name and give you the number. Only a portion of the name need be entered. HART will return numbers for all occurrences of the name entered, (e.g. PERC will return all perch).

10. BOAT-ID

This parameter has restricted entry as the information by vessel is classed as confidential. Therefore a password is required to be entered before GFSEL will accept a boat code. This password is only supplied by the statistics unit for specific research requests. The BOAT-ID must be 3 characters and a valid code on the master vessel file.

11. SECONDARY-SPECIES

Entry of secondary species codes causes the select program to reject landings that passed all other criteria but do not have all of the secondary species present. Lumping means that the presence of any one of them is sufficient to select the landing. No lumping means all species must be present before the record is chosen. They will be accepted at any qualification level and utilization unless you enter further restrictions using the SPECIES option. Examples:

(a) To find landings of 2 species when caught together,
entering: SECONDARY? = 467,405
LUMPING? = No;
will give the catch of 467 and 405 separately for all qualifications and utilizations when these species were caught at the same time.

(b) To find incidental catch while targetting on one species,
entering: SPECIES? = 467, qualification? = 25,
utilization? = 1
SECONDARY? = 467
SECONDARY? = 405,437 LUMPING? = yes;
will select records where species 467 is 25% of the catch and either of species 405 or 437 is present. From these selections it produces separate totals of species 405 and 437 caught when species 467 was the target species. The catch for species 467 will only be those catches of 467 when species 405 or 437 was present (i.e. not the total catch). To find the total target catch of 467 (25% qualification) GFSEL program must be run again without any secondary species.

12. DEPTH

This entry sets the minimum and maximum acceptable average depths.

They must be integers in the range 0 through 999. Only one such entry per search (e.g. 30,39).

13. VESSEL-CLASS

Vessel class is related to gross tonnage. Acceptable entries are 0 through 9.

14. MONTH-DAY

This option sets the acceptable date range for landings within a selected year (eg. MAR01-APR07).

15. TRAWL-GEAR

This field defines valid gear types within trawl trip reports and sales slips. As gear types are only used with trawlers be sure to select appropriate SOURCE codes.

16. SCAN

The selected landings will be displayed on the terminal with this option. A "-1" in a field indicates the data for that field was not present on the original data file. Do not use this option when running in SYS$BATCH.

17. EXIT

This option will stop the program and return the user to the VAX VMS operating system.

B. GFREAD subroutine

A FORTRAN subroutine was written to gain access to the groundfish master data files. The subroutine GFREAD can be interfaced with user programs by linking the user program with [QHAMER.DEMERSAL]GFREAD. The calling program must not use logical unit 50 as it is used by GFREAD. The subroutine is accessed by the statement CALL GFREAD (I,NYR,PASSWORD).

I: integer*4 variable initialized to zero for the first call to GFREAD and must not be altered subsequently by the calling program.

NYR: integer (2 digits) representing year of data to read.

PASSWORD: variable which is checked against the vessel password used by GFSEL. If password is correct the data will include the vessel code. If password is wrong or omitted the vessel codes will be blanked out.

The master file is sorted by source, minor area, month, day, and serial number. The species vector is in ascending order by species code. A

"-1" in any field indicates that the information was not present on the original data. Landings that have no catch (i.e. reflect effort only) will have LSPEC=1, SPCOD = 0, UTIL = -1.

One complete landing is delivered to the user program by each call. A landing may have as many as 50 species-usage entries.

The user program and GFSEL communicate via the common block code which is accessed by the FORTRAN statement:

```
INCLUDE-'DRA1:[QHAMER.DEMERSAL]GFMSTCOM.FOR'
```

The variable names and explanations are:

```
   SOR - source
  ISER - serial number of landing (not unique within year)
 IDAYF - days fished in tenths (35 means 3.5 days)
  ITOW - tow time or soak time in minutes
ISKATE - number of skates
 ISPAC - hook or trap spacing in feet
 IHOOK - number of hooks or traps
 IDRAG - number of drags
 IDMIN - minimum depth
 IDMAX - maximum depth
 IDAVG - average depth
   CLS - vessel class
    GR - gear type
 TRAPT - trap type
IALLCAT - total catch
  ISCOD, ISCAT, UTIL - species code, catch and usage
   VES - blanked out to users
  LDUM - reserved for GFREAD
 LSPEC - number of species entries (max. is 50)
```

The master file common block code is as follows:

```
BYTE
     SOR,DAY,MON,YR,PORT,LTRIP,CLS,GR,AID,MAJ,MIN,LOC,
     TRAPT,BAIT,UTIL(50),LDUM,LSPEC

CHARACTER
 VES*3

INTEGER*2
 ISER,IDAYF,IDRAG,ITOW,ISKATE,ISPAC,IDMIN,IDMAX,IDAVG,
 ISCOD(50)

INTEGER*4
 IALLCAT,ISCAT(50),IHOOK

COMMON /MSTRBYTE/
     SOR,DAY,MON,YR,PORT,LTRIP,CLS,GR,AID,MAJ,MIN,LOC,
     TRAPT,BAIT,UTIL,LDUM,LSPEC
```

```
COMMON /CHARBLK2/
 VES

COMMON /I2BLK/
 ISER,IDAYF,IDRAG,ITOW,ISKATE,ISPAC,IDMIN,IDMAX,IDAVG,
 ISCOD

COMMON /I4BLK/
 IALLCAT,ISCAT,IHOOK
```

ACKNOWLEDGMENTS

Generation of a computer-based system for Groundfish data benefitted from the forethought and care put into the establishment of data standards at the initial stages of data collection. K. S. Ketchen, C. R. Forrester and J. A. Thomson played key roles in that process and their legacy simplified our tasks. B. M. Leaman and L. A. Lapi established the reporting formats and interfaced the management and research requirements for the system.

We thank L. A. Lapi, B. M. Leaman, and R. D. Stanley for their comments on initial drafts of the report.

APPENDIX I. Trip report forms.

TRIP REPORT

Date July 10/84 **Dock/Company** J.S. McMillan **Port of Landing** Vancouver

Boat MISS MARY IV **Skipper** John Doe **Gear** Trawl

Length of Trip 10 days

Minor Areas Fished

DATE(S) FISHED	DAYS FSHD	SETS DRAGS	Hours	Areas Fished	CODE	DEPTH (FMS)
1	1.8	18	19.8	Esperanza		78-81
2	1.0	5	10.0	Firing Range		28-35
3	2.0	9	20.5	West of Langara		130
4						
5						
6						
7						
8						
9						

Landings. Pounds of fish by species.

Species	1	2	3	4	5	6	7	8	9	Est.	Actual
Petrale sole	1722									2000	1722
Rnd. lingcod	10450									10000	10450
S. brevispinis	9821									10000	88391
S. pinniger	78570									80000	rockfish
Rock sole	-	2653								2600	2959 sole
Lemon sole	-	306								300	
Rnd. Pacific cod	120	3862								4000	3982
S. alutus			95686							96000	
S. proriger			27908							28000	133562
S. zacentrus			9968							10000	perch

Comments

TRIP REPORT

DATE April 20/84 DOCK/COMPANY _____ PORT OF LANDING Vancouver

BOAT MISS JOAN SKIPPER J. Doe GEAR Longline

LENGTH OF TRIP 5 days MINOR AREAS FISHED 18,

	DATE FISHED	NO. OF SKATES	SOAK HOURS Average	FISHING LOCATION	AREA CODE	DEPTH (fms.)
1	Apr.18,19	10	2.0	McCall Bank		50
2	Apr.16,17	5	3.0	East of Gabriola Is.		90
3						
4						
5						
6						

LANDED CATCH OF FISH BY SPECIES (lbs.)

SPECIES	1	2	3	4	5	6	EST.	ACTUAL
Dogfish	10521	7890					18000	18411
Rockfish		325					300	325
TOTAL								

DISCARDS	1	2	3	4	5	6	EST. WT. (lbs.)
Small dogfish	2000	1000					3000
TOTAL							

GEAR DATA

GEAR TYPE	NO. MEN	NO. SKATES	NO LINES	HOOK SIZE / TRAP TYPE	NO HOOKS / TRAPS PER SKATE — COMMENTS
Longline	2		2	6283	400 hooks/skate

HOOK / TRAP SPACING	GANGION LENGTH	GANGION WT.	GANGION KIND	GROUNDLINE WT.	GROUNDLINE KIND	BAIT TYPE
4 ft	12 in.	48	Nylon	28	Nylon	Herring

COMMENTS

Appendix II. Definition of codes.

Field	Size	Code	Description
Source	1	1	trawl trip report
		2	trawl sales slip
		3	longline trip report
		4	longline sales slip
		5	trap trip report
		6	trap sales slip
Serial	4	-	number assigned to each landing as it is coded. Each year begins at number one.
Day	2		
Month	2		date of landing
Year	2		
Port	1	1	Vancouver
		2	Steveston, Ladner
		3	Prince Rupert
		4	Victoria, Sidney
		5	Namu
		6	Klemtu-Butedale
		7	Port Hardy, Bull Harbour
		8	Tofino, Ucluelet
		9	Other
Vessel	3	See register of vessels maintained by statistics unit	
Class	1	1	0-14 gross tons
		2	15-24 gross tons
		3	25-49 gross tons
		4	50-74 gross tons
		5	75-99 gross tons
		6	100-149 gross tons
		7	150-199 gross tons
		8	200-299 gross tons
		9	300-399 gross tons
		0	400+ gross tons
Gear	1	1	single
		2	double
		3	double and drum
		4	shrimp trawl
		5	single and drum
		6	gillnet drum
		7	Danish seine
		8	midwater trawl
		9	pair trawl
		blank	unspecified

Appendix II (cont'd)

Field	Size	Code	Description
Aids	1	0	none
		1	radar
		2	loran
		3	fish finder
		4	radar and loran
		5	radar and fish finder
		6	loran and fish finder
		7	radar, loran and fish finder
		blank	unspecified
Trip length	2		number of days of the trip
Major area	2	01	4B - Strait of Georgia
		02	3B - Washington coast
		03	3C - Southwest Vancouver Island
		04	3D - Northwest Vancouver Island
		05	5A - South Queen Charlotte Sound
		06	5B - North Queen Charlotte Sound
		07	5C - South Hecate Strait
		08	5D - North Hecate Strait
		09	5E - West coast Queen Charlotte Is.
		10	6 - Alaska
Minor area	2	01	2A East
		02	2B East
		03	1 East
		04	4
		05	5 Upper
		06	5 Lower
		07	6
		08	8
		09	9
		10	10
		11	11
		12	12
		13	13
		14	14
		15	15
		16	16
		17	17
		18	18
		19	19
		20	20
		21	21
		22	22
		23	23
		24	24
		25	25

Appendix II (cont'd)

Field	Size	Code	Description
Minor area	2	26	26
		27	27
		28	28
		29	29
		30	C
		31	2A West
		32	Southeastern
		33	Yakutat
		34	2B West
		35	1 West
Locality	2	Refer to locality code sheet maintained by statistical unit	
Days fished	4	Number of days (in 1/10 days) fishing (one decimal place is implied)	
Sets	2	Number of sets or drags made	
Time	5	Will accept decimal (e.g. 2.5 or 24.67) trawl - total fishing time in hours. Longline or trap - average length of soak time for each set.	
Depth min.	3	Minimum fishing depth in fathoms	
max.	3	Maximum fishing depth in fathoms	
avg.	3	Average of min and max fishing depths in fathoms	
Skates	4	Number of skates set (trap or longline)	
Hooks/traps	6	Total number of hooks or traps set (trap or longline)	
Spacing	3	Length between hooks or traps in feet	
Trap type	1	1	Korean
		2	Rectangular or collapsible
		3	Korean and rectangle mix
Bait	1	1	Herring
		2	Pacific cod
		3	Herring and Pacific cod
		4	Herring and pollock
		5	Squid
		6	Herring and sablefish
		7	Mixed
		8	Herring and squid

Appendix II (cont'd)

Field	Size	Code	Description
Species	3	Refer to Hart option	
Utilization	1	1	Food fish
		2	Animal food
		3	Reduction
		4	Dumped
		5	Bait
		6	Discards
		7	Landed but not reported as sold
Catch	7	Weight of species catch in pounds	

Appendix III. Sample run and result of program GFSEL.

```
$GFSEL
     Hello _____________
     Suggestions for modifications should be given to statistics unit
     Enter selection field name or HELP
     YEAR
     Enter years
     83
     Enter selection field name or HELP
     SOURCE
     Enter sources
     1
     Enter selection field name, or HELP
     MINOR
     Will you want particular locations within this minor area? (Y/N)
     N
     Enter minor
     31,34
     Enter selection field name or HELP
     SPECIES
     Enter species codes
     396
     Do you want to select by Qualification level for species selected above?
       (Y/N)
     N
     Do you want to select by Utilization? (Y/N)
     Y
     Enter utility codes
     1,7
     Enter selection field name or help
     <CR>
Entering Search Phase

Result:

     Years:  83
     Source:  1
     Minor:  31,34
     Species:  396,440
     Qual-utils:  0% using utilities 1,7
        Total catch on selected landings:  1869.8 (metric tons)
        (Includes all species - all uses)
        Components of above catch by usage code:

          1        2        3        4        5        6        7
       ------   ------   ------   ------   ------   ------   ------
       1790.4    12.3     3.6      0.0      0.0      61.7     1.8
```

Appendix III (cont'd)

Effort-CPUE: Trawl in hours. Longline 1000's hooks.
Trap in traps.

	Trawl	Longline	Trap		Trawl	Longline	Trap
Catch-Effort for all species all uses:							
SP ALL CAT:	1869.80	0.00	0.00	EFF:	716.4	0.00	0
				CPUE:	2.610	0.000	0.000
Catch-Effort for selected species and uses:							
SP 396 CAT:	762.67	0.00	0.00	EFF:	629.8	0.00	0
				CPUE:	1.211	0.000	0.000
SP 440 CAT:	556.22	0.00	0.00	EFF:	575.5	0.000	0
				CPUE:	0.967	0.000	0.000
SP SEL TOTAL CAT:	1318.89	0.00	0.00	EFF:	1205.3	0.00	0
				CPUE:	1.094	0.000	0.000

Appendix IV. Management of the 1954-81 groundfish data.

The following is an outline of the processes involved in the maintenance of the groundfish data base for the years 1954 to 1981.

The original data files for these years were edited and verified and then direct access year and key files (GF19nn.DAF, GFKEYS.DAF) were built. If changes are required to the data files then these processes must be performed again (Fig. 3).

Each year's data file (GF19nn.DAT) which resides on its own tape must be copied onto disk. Changes can be made to this file using the screen-oriented editor. The GF19nn.DAT file contains records of 80 byte card image data in the old format (see Appendix V) plus a 6 byte record number. The record number is the records position in the input unsorted file.

The program GFEDIT consists of three phases; (i) the sort, (ii) the error checks, and (iii) the building of the direct access files (GF19nn.DAF, GFKEYS.DAF). GFEDIT will print a hard copy of the summary file of records which may have errors and create a file (GFEDIT.LIS). This file can be printed to see all the records in landing sets that have edit conditons. To ensure no fatal errors in the data, this program is submitted as: SQN/PARAM=(GF19nn.DAT,nn) GFE. Once the data is clean another run is submitted as follows: SQN/PARAM=(GF19nn.DAT,nn,YES) GFE. This includes the option to build the direct access files. The new data file (GF19nn.DAT) is saved and copied onto tape by the program BACKUPnn.COM. The new direct access files (GF19nn.DAF) are now part of the data base and can be used by the general retrieval program GFSEL.

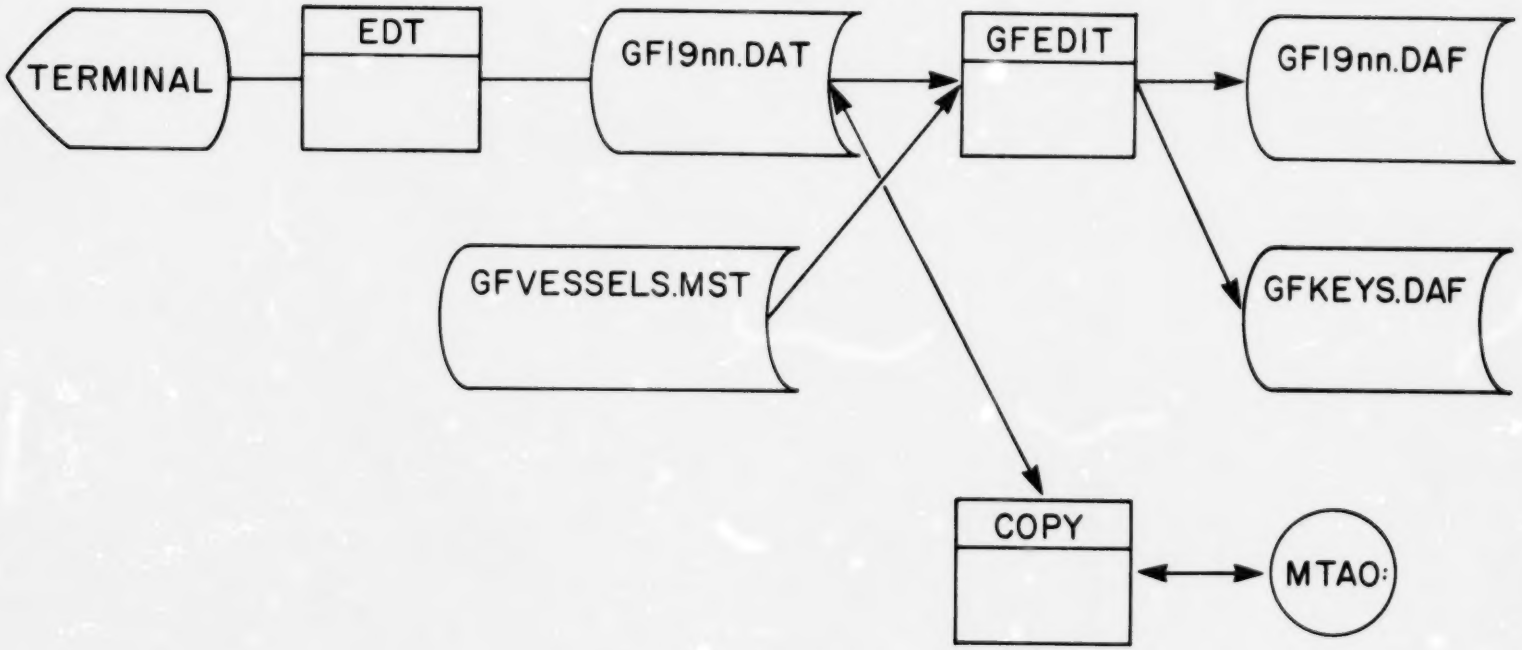

Fig. 3. Flow chart of programs and files involved with the management of the 1954-1981 groundfish catch data.

Appendix V. Format of the 1954-81 data files (GF19nn.DAT).

Column No.	Title
1	Source
2-5	Serial No.
6,7	Day
8,9	Month Date of landing
10,11	Year
12	Port
13-15	Vessel name
16	Class
17	Gear
18	Aids
19-20	Length of trip
21-22	Major area
23-24	Minor area
25-26	Locality area
27-29	No. of days (1/10) fishing (00.0)
30,31	Drags or sets
32-35	Minutes of total trawl time or minutes of length of soak time
36-38	Minimum fishing depth in fathoms
39-41	Maximum fishing depth in fathoms
42-44	Average fishing depth in fathoms
45-50	Total catch
51	Utilization
52-54	Species
55-60	Species catch
61-63	Percentage species catch of total catch
64,65	Total number of skates set
66-70	Number of hooks or traps set
71-73	Hook or trap spacing
74	Trap type
75	Bait
80	Header record for first record of a landing set

The codes are the same as those defined in Appendix II.